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Digital Decoupling and Disentangling: Towards Design for Romantic Break Up

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ABSTRACT

Romantic relationships are often facilitated through digital technologies, such as social networking sites and communication services, and ‘digital possessions’, such as messages sent to mobile devices and photos shared through social media. When individuals break up, digitally disconnecting can be facilitated by using those digital technologies and managing or curating these digital possessions. This research explores the break up stories of 13 individuals aged between 18 and 52. The aim of this work is to inform the design of systems focused on supporting individuals to decouple and disentangle digitally in the wake of a break up. Four areas of interest emerged from the data: communication, using digital possessions, managing digital possessions, and experiences of technology. Opportunities for design were identified in decoupling and disconnecting, designing around guilt, and promoting reflection to enable curation.

Author Keywords

Relationship break up; digital possessions; digital technologies; decoupling; disentangling; curation; reflection; reminiscence; management; technology use.

ACM Classification Keywords

H.1.2 [Models and Principles]: User/Machine Systems – Human factors; H.4.3 [Information Systems Applications]: Communications applications; K.4 [Computing Milieux]: Computers and Society.

INTRODUCTION

Affection is a basic human need [23] that we experience by having and maintaining different types of relationships; with friends, family, and nature. Our need for affection is also satisfied by engaging in and maintaining romantic relationships with other individuals, by making love, expressing emotion, and interacting with them in ‘spaces of togetherness’ [23]. There are many widely used digital services available to connect individuals, and support them

in making these romantic connections; Tinder, Grindr, OkCupid, Match.com, Tastebuds, and more. On their 20th anniversary, Match.com reported pairing over a quarter of a billion matches, as well as being responsible for over 100 million relationships and one million babies [9]. Even relationships that begin offline have a digital element, as digital technologies can allow partners to maintain their relationships [4,12], and plan or acknowledge important relationship milestones such as getting married [22] or becoming a parent [37].

Whether serious or casual, relationships enacted in a digital context will have a number of *digital possessions* associated with them [18]. In the context of this work, we use the term ‘digital possessions’ to collectively refer to different types of digital materials that belong to an individual. These include images, videos, chat logs, emails, social media posts, meta-data, login details, text messages, shared accounts, and more [29,33]. These digital possessions play a role in how individuals establish their identities and connect with others digitally [28], similar to the role fulfilled by their physical possessions. By generating content on these sites and services, as well as creating digital possessions in other ways, individuals weave together their digital presences. For example, going ‘Facebook Official’ with a partner by updating one’s relationship status on Facebook publicly links the partners’ accounts together, and has been found to not simply facilitate romantic interactions, but shape and define the romantic relationships [11].

However, when a romantic relationship ends, how do individuals decouple and disentangle their digital presences after so many digital services and possessions have been connecting and entangling them? These digital possessions, which previously contributed to each individuals’ identity as a partner in a relationship, do not just disappear. Rather, the persistence of digital possessions often requires that an individual intervene in order to curate and manage each possession [26].

In this paper, we report on qualitative research that examines the ways in which individuals used digital technologies and digital possessions after a romantic relationship came to an end. The aim of this work is to inform the design of systems focused on supporting individuals to decouple and disentangle digitally in the wake of a break up. We will first situate the research in the

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context of related work that examines post-break up behaviours in a digital context, digital possessions in a post-romantic context, and digital identity. We will then describe the research methodology and introduce our participants before outlining our results, which will be used as the basis for a discussion around potential design opportunities.

RELATED WORK

To situate our work, we consider research conducted in the areas of HCI and social psychology.

Post-Break Up Behaviour in a Digital Context

There have been a number of studies investigating the process and consequences of romantic relationships coming to an end. Research has defined the various stages of relationships coming to an end [1], explored the role of forgiveness on partners' relationships after infidelity [16], and examined the impact of break ups on an individual's levels of psychological distress and life satisfaction [31].

Recently, research has begun to focus on the behaviours individuals adopt on social networking sites (SNS) after experiencing a break up. Lyndon et al found three ways in which individuals can use Facebook negatively after experiencing a break up; venting, covert provocation, and public harassment [20]. They found that Facebook has become a tool for gathering information post-break up. The affordances of SNS such as Facebook offer opportunities for information seeking after a break up; ex-partners have been found to take advantage of the system's information visibility and their own invisibility of movement on the site to keep tabs on one another [36].

Surveillance of ex-partners, or 'Facebook stalking', has become fairly common practice, despite the negative effect it can have on the individual engaging in the activity [21]. Marshall investigated how continued contact online with an ex-partner, or engaging in surveillance of an ex-partner, impacted moving on in terms of post-break up adjustment and personal growth [21]. This research found that continued online exposure to an ex-partner may inhibit post-break up recovery and growth; frequent monitoring of ex-partners' Facebook pages was associated with greater distress over the break up, negative feelings, sexual desire, longing for the ex-partner, and lower personal growth. Ultimately, this use of Facebook is not advised, as the negative outcomes are well documented [10,20,21,36].

These studies investigate how individuals utilise SNS to gather information on their ex-partners, but they do not explore specifics of how different digital possessions are dealt with after break up, or the effect curation has on post-break up recovery and personal growth.

Digital Possessions in a Post-Romantic Context

Digital possessions are created and collected over the course of a relationship. When a relationship ends, they do not simply vanish; they need to be curated in some way. However, the task of curation after a relationship break up is often left incomplete as it is an emotionally taxing

process [33], with digital possessions cueing potentially painful or emotional memories from the relationship. There are also practical challenges associated with the curation of digital possessions when two or more individuals are involved, which are notably absent when curating their physical counterparts. A prime example of this is ownership; the ease with which digital possessions can be copied, downloaded, and shared has been the subject of prior work [26,33,35]. Determining who has ownership of a physical possession often boils down to access and the actual location of that single object. In contrast, digital possessions can exist in multiple places at one time, can have multiple owners, and can be accessed by multiple people [35], even if ownership of the original possession can be clearly traced back to one individual.

In the context of curating digital possessions after a relationship break up, three curation roles have been identified in previous research; those of *Deleters*, *Keepers*, and *Selective Disposers* [33]. Deleters engage in total disposal of digital possessions, keepers retain all of the possessions, and selective disposers engage in a hybrid strategy to dispose of all but a few treasured possessions. Although emotionally taxing, curating and disposing of digital possessions after a break up is a necessary step towards defining a new digital identity as an individual, as part of the process of moving on [34].

Digital Identity

A primary function of digital possessions is to contribute to an individual's digital expression of self [19], where those possessions document an individual's experiences and act as the basis for an online or digital identity. By creating and sharing digital possessions centred around their relationship, partners begin to construct an identity that focuses, at least in part, on their togetherness. In particular, the practice of taking and sharing photographs online has been noted as a key method for expression of one's self and identity in digital contexts [14,25,32]. An individual's identity can have a number of facets, depending on the content of the digital possessions in question, or depending on the social or communication platform in use [8]. The varying facets of an individual's identity can be understood by considering Goffman's concept of 'the performance of self' [13], where an individual will craft and 'perform' different curated representations of their identity, adapting them to be appropriate for different audiences. This is reflected in the digital domain, where individuals curate their digital possessions to project a particular identity: for example, the digital possessions an individual will put on their LinkedIn profile will likely be professionally orientated, whereas digital possessions placed on a Facebook profile are more likely to be personal in nature. The content deemed appropriate for one facet may not be appropriate for another, and allowing the wrong audience to view an inappropriate performance may have negative consequences, such as losing a job [5]. In the context of a romantic relationship break up, we can consider an

individual being a partner in a relationship as one facet of their identity, and, post-break up, their identity as a single individual as another. Managing these two disparate facets is an important step towards moving on [34]; in a digital context, this typically involves managing and curating digital possessions in order to construct an identity independent from the ex-partner.

METHOD

Approach

An experience-centred design (ECD) approach was adopted for this research [39], where semi-structured interviews were carried out with participants on a one-to-one basis. The ECD approach worked particularly well in the context of this research; the dialogical approach to gathering the data in the form of stories was natural to participants, who had previously shared their stories with friends and family, and allowed for greater understanding by both the researcher and the participants in the retelling [24,39]. The interviews took place in participants' homes when possible, where the participants were surrounded by their belongings and had access to their digital possessions [7]. On three occasions this was not possible, and these are addressed below. In each of these instances the participants had access to their devices and digital possessions during the interviews. Mean interview time was one hour and seven minutes (shortest interview was 48 minutes, longest was one hour and 34 minutes). Some interviews took longer than others, simply because some participants had more of a story to tell than others. Each participant was given a £5 Amazon Voucher at the end of the interview to compensate them for their time.

Each interview was comprised of three sections. Firstly, the participant was asked to tell the story of their relationship; these contextual questions were open-ended (e.g., *What was the relationship like?*), and were targeted at finding out how the participant and their ex-partner met, how long the relationship lasted, whether or not the participant considered it serious, and how and why they broke up. Secondly, the main section of the interview involved the stories surrounding a number of digital possessions of specific types pertaining to the past relationship. Each participant was given a (non-exhaustive) list of types of digital possessions to prompt their selection. This included digital photographs or digital photo albums; social media posts; video clips, chat histories, audio files, emails, accounts that they shared ownership of; accounts that they shared use of; text messages; and other. For *each meaningful digital possession that they identified*, the participant was asked: (1) *What is the story of this digital possession?* (2) *How did the way you use the possession change when the relationship ended?*

The final section of the interview focused on how much interaction the participant had with the identified digital possessions since the break up, as well as whether or not the participant felt that they had the means to deal with their

digital possessions through currently available technologies. The authors' institutions granted ethical approval for the research. Due to the personal nature of the interviews, the researchers had procedures in place to minimize risk to participants: the interviewer was sensitive to any signs of distress from participants during the interviews, and participants were offered opportunities for breaks when appropriate. Details for free counselling services were prepared in the event that the participants wanted to continue talking with a professional. All interviews were audio recorded and transcribed.

Participants

This research was carried out across a number of cities in the UK. The participants were primarily recruited through posters on university campuses, cafes, shops, and public notice boards, as well as through social media sites. Participants ranged in age from 18 to 52 years old, had been in relationships for between 10 months and 29 years in duration, and had been separated from their ex-partners for between four months and four years. Of the 13 participants, the majority were female (n=10). All participants were educated to at least undergraduate level (or were enrolled in an undergraduate degree at the time of the interview), and were all in full-time education or employed.

No exclusion criteria were set in relation to gender, sexual orientation, or on the type of relationship. The only exclusion criteria put into place was that all participants be aged 18 or older. The sample size is reflective of the sensitive nature of the research topic, and is similar to other research that explores sensitive contexts [6,15,27]. Although participants of any sexual orientation or gender were welcome to take part in this research, this study was limited in that the participant group consisted almost entirely of heterosexual individuals (n=12). Another limitation of this participant group is that of the gender split; the participants were predominantly female (10 female, 3 male), which will have had an effect on the perspective of the stories gathered and the subsequent recommendations for design.

Each participant has been assigned a pseudonym, and is referred to by their pseudonym followed by their age after this section. A small summary of each participant is included below:

- *Sophia*, 25, and her partner met at university and cohabited throughout their relationship. The pair broke up because of Sophia's infidelity, and her ex-partner's alcoholism. Sophia is currently in a relationship.
- *Emma*, 18, and her boyfriend broke up as a result of Emma moving to another city for university. They ended their relationship on good terms, and are still in contact.
- *Baozhai*, 21, described her past relationship as being 'between serious and committed dating'. She ended the relationship upon discovering her partner's infidelity.
- *Olivia*, 19, and her partner moved to separate parts of the country to attend different universities, and the

relationship became more challenging as it became long-distance. Olivia subsequently cheated on her partner, and the pair eventually agreed to end the relationship.

- *Ava*, 34, moved to a different country for work, with the intention that her partner would eventually join her. She then fell in love with another man. She and her partner broke off their engagement, subsequently ending their relationship. The pair remain close, and maintain regular contact. Ava's interview took place at the university as she had no internet access at home. Many of the digital possessions she wanted to discuss existed online.
- *Wilson*, 22, moved to a different country for university during the final year of his relationship. Although he did not want the relationship to come to an end, he felt that it was unfair to continue it, as both he and his partner were struggling with sustaining the relationship at a distance.
- *Bella*, 20, was the study's only homosexual participant. Her relationship came to an end through a number of factors; the major two being that Bella was dealing with depression, and that her partner decided to transition from female to male. The two are still quite close friends and continue to support one another.
- *Noah*, 52, is currently finalizing his divorce. He and his ex-partner have had three children together. A mistaken diagnosis of cancer led Noah to re-evaluate and then end his relationship. Noah's interview took place at a rental home. He was living separately from his wife and children, who remained in the family home. Noah had a hard drive that held copies of all his digital possessions, taken from the computer in his family home.
- *Mia*, 20, was in a relationship that became long-distance for the last four months. Mia felt she couldn't cope with the distance and ended the relationship via Skype.
- *Zoe*, 33, broke up with her boyfriend briefly during their relationship before getting back together. They broke up for a second, and final, time, after Zoe decided that she had 'just had enough'. Zoe has since become engaged to her new partner.
- *Deborah*, 19, met her partner while gaming online. Deborah's partner ended the relationship due to pressure from his mother, who did not think they were a suitable match. Deborah cites cultural differences as the underlying issue, and was frustrated that her relationship ended in this way.
- *Emily*, 23, became engaged to her partner at 18. The couple planned to get married after graduating from university. Emily was accepted into a university away from her home town. Her partner failed to get accepted into his chosen university. This put a strain on their relationship. Eventually Emily decided the relationship was over and ended it by cheating on her partner.
- *Ethan*, 24, and his partner both agreed that breaking up was the right thing to do. Although they intended to keep in touch, they have not spoken since the break up, 18 months ago. Ethan's interview also took place at the

university: he felt that he did not have enough privacy at home to discuss his past relationship.

Name	Relationship Duration	Time from Break Up to Interview	Who Initiated Break Up
Sophia	4 Years, 6 Months	2 Years	Ex-Partner
Emma	10 Months	8 Months	Mutual
Baozhai	2 Years, 6 Months	4 Months	Participant
Olivia	3 Years, 6 Months	1 Year, 3 Months	Mutual
Ava	14 Years	5 Months	Participant
Wilson	4 Years	1 Year	Participant
Bella	1 Year, 2 Months	1 Year, 5 Months	Participant
Noah	29 Years	8 Months	Participant
Mia	4 Years	6 Months	Participant
Zoe	8 Years, 6 Months	3 Years	Participant
Deborah	2 Years	10 Months	Ex-Partner
Emily	5 Years	4 Years	Participant
Ethan	4 Years	1 Year, 6 Months	Mutual

Table 1: Break up information – relationship duration, time from break up to interview, and who initiated the break up.

Analysis

The interview data was analysed through the construction of an affinity diagram due to the high amount of qualitative data involved. Quotes from the transcripts, termed '*affinity notes*', were physically organized based on their affinity to one another [2] over the course of two day-long sessions. Five researchers analysed approximately 50% of the data using affinity diagramming. The other 50% of the data was analysed by the lead author individually using the same method, adding to the structure as required. The researchers began by organizing the affinity notes, constructing individual affinity diagrams, while discarding affinity notes that did not relate to the research aims. The researchers then merged their individual affinity diagrams into a cohesive structure before embarking on an iterative cycle of reviewing and refining the affinity diagram, discussing each affinity group and giving it a clear definition.

Through three iterations of reviewing and refining, a large number of groups were condensed together, based on their affinity with one another. The lead author then analysed the second tranche of interview data, using the structure that the researchers had created as much as possible. The lead

author then reviewed and refined all of the affinity groups twice, sorting through each of the affinity notes (including those that were discarded) to ensure that none needed to be rehomed in a new or different group. From the initial 470 affinity notes selected for analysis, 286 were used. Seven final affinity groups were created, resulting in contextual insights in four areas across the participants' accounts: *Communication, Using Digital Possessions, Managing Digital Possessions, and Experiences of Technology.*

RESULTS

Our results are organised under the four areas identified above, under which we discuss common and contrasting experiences across participants. No emphasis was placed on Facebook by the interviewer; the participants tended to focus strongly on Facebook as it was the dominant tool that they used to create and manage their digital possessions.

Communication

All participants spoke of their experiences with communication technologies; digital possessions and communication mediums such as chat histories and messaging services featured prominently in the participants' stories, as did profiles and posts on SNS.

Silence is golden

The connectedness that communication technologies brought to ex-partners was not always welcome. In the case of Ava-34, who was romantically linked to another man while still in a relationship with her fiancé, the connectedness afforded them by technology was viewed as a burden: "...there were moments where I just didn't answer for days because I was with somebody else. I could hardly be there and text him. It was a really practical thing... I let my battery run down, and then I just didn't have any connection anymore." Non-communication was more often seen as a response to feeling guilty over ending a relationship. Emily-23 said "I didn't tweet, or Facebook, or anything, because again, you don't want to rub it in." Zoe-33, highlighted the fact that she felt very wary of posting anything to social media or announcing her new relationship digitally in case it hurt her ex-partner, who was, at the time, struggling to deal with the break up. Ironically, after her ex-partner embarked on a new relationship, he had no such issue: "...I was really annoyed because they got to have a fresh start, fresh go... in general, in life. When I started going out with my new boyfriend, I was still dealing with the aftermath, and his (ex-partner's) constant abuse... It wasn't fair, I felt."

Beyond the participants reporting instances where they did not communicate with their ex-partners, some participants (n=4) spoke of being on the receiving end of this non-communication. Emily-23's ex-partner cut off contact with her for approximately a year after they ended their relationship; "I couldn't tell where he was, mentally. It felt like I didn't know him anymore. It'd been a year that we'd been apart, and he wasn't part of that year. So that was a bit scary." As Emily-23 did not completely break her digital

connection to her ex-partner after their relationship ended, he was subsequently able to contact her when he was in the right frame of mind: "He had sent me a message saying that he wanted to thank me for breaking up with him, and me having the courage, because we both knew it wasn't working, but he wasn't brave enough."

Checking up, but not checking in

Some participants (n=3) spoke of visiting their ex-partner's Facebook page to check up on them, Emily-23 commented: "... I've definitely gone on his page every now and then just to see if he's okay... it's because I basically cheated on him, I feel a bit guilty, and I probably felt like I'd ruined him." Contrary to the literature cited previously, these three participants were not carrying out surveillance on their ex-partners to feel connected to them. Having instigated the ends of their relationships, feelings of guilt were common across Emily-23, Olivia-19, and Zoe-33, all of whom used SNS as surveillance tools to keep tabs on their ex-partners for their own piece of mind. Zoe-33 stated: "I'm friends with him on Facebook, but I don't have him as an active feed, to check that he's okay. Because [breaking up] was so bloody awful... I was checking, and I was happy because I was thinking, you've done the right thing for both of you."

Experiencing abusive behaviour

Communication services were the primary medium through which some participants (n=2) experienced abusive behaviour from their partners. Sophia-25 recalled that her ex-partner used a variety of Google tools to harass her; spamming her with messages on Google Hangout, and stalking her via Google location services: "By this stage I had blocked him on Google because I was sick of getting his constant messages... but I didn't know that I hadn't also blocked the location services... He basically tracked me, knew I was [at an event], knew the exact time, how long I'd been there, and all that stuff... It was really creepy, it was really terrifying as well." Sophia-25's ex-partner was able to exploit tools the couple had previously used to sustain their relationship due to Sophia-25 simply not being aware of this aspect of the digital connection they still shared.

Similarly, Zoe-33 discussed her ex-partner's evolving context of use with regards to Whatsapp. Whereas before she commented that she would be lucky to receive replies to her text messages, after they broke up, "He realized that [Whatsapp] was kind of a tool, where you could get in touch with someone and always get them. I felt really attacked."

Using Digital Possessions

Evidence of abusive behaviour

After relationships came to an end, the role of digital possessions often shifted. Across a number of participants (n=3), their digital possessions became evidence, used as proof of the ex-partners' actions across a variety of audiences, with increasing degrees of seriousness. Zoe-33 and Sophia-25 both spoke about saving texts or screenshots of call logs to show friends the kind of abusive behaviours

they were receiving. Zoe-33 said *“At the time, I was storing texts to show people – to go, what am I dealing with!? This is why I split up with him! To have that evidence.”* Sophia-25 went a step further, taking screenshots of abusive messages from her ex-partner and showing them to a lawyer whom she asked for advice; *“They were getting really nasty (the messages), so I screenshotted them and sent them to my lawyer.”* Sophia-25 was advised to take the digital possessions to the police, and was subsequently granted a six-month-long no-contact order¹ for her ex-partner. Similarly, Noah-52, who was in the midst of his divorce during the interviews, commented that his motivations for keeping digital possessions from his relationship changed as a result of his relationship ending; *“The only things I’ve kept now, that I wouldn’t have kept before, are evidential... but that’s so I can produce them in court, or in evidence.”*

Reminiscence

As participants told the story of their experiences, they often reminisced on different aspects of their relationships. Emma-18 talked about her positive connection to the digital possessions from her relationship, stating *“It was a happy time in my life, so even if I have a rough patch, or if I’m not feeling too good or whatever, I know I can look back at that time and bring back all the good memories.”* Positive associations were observed for at least one digital possessions across some participants (n=7), but negative associations were more prevalent across all interviews. For example, Emily-23 reminisced about her ex-partner’s marriage proposal when looking at a photo taken at that time: *“I feel sick, nauseous... I think I knew at the time that it wasn’t going to work out, and it wasn’t right, but you can’t say no to someone when they’re sitting in a fucking gondola with you, with a ring in their hand!”* Despite being a digital possession that cued negative reminiscence, Emily-23 was able to look back on events surrounding her engagement with at least some humour.

This humorous outlook while reminiscing was not common across participants. Many remembered struggling with the relationship ending, or the aftermath of the break up. During her relationship, Bella-20’s then-partner commissioned a digital comic book, depicting the story of how they met, giving it as a gift to Bella-20 on her birthday. Bella-20 talked about her experiences coming into contact with the comic book since the break up: *“For a long time, I was just really sad that it didn’t work out between us, and it just made me kind of miss us being together.”* Noah-52 shared a deeply personal reminiscence when he discussed a particular digital possession from his past, one he highlighted as being one of the most meaningful from his relationship; a photograph taken just after his son passed away, soon after his birth. *“There’s a particularly powerful*

image... which is me looking straight to camera with [my son] in my arms, between the minutes of him being born – [ex-partner] was knackered after a traumatic birth, and the nurses withdrew to give us some - after things sorted themselves out, he went cold in my arms. And that thousand-yard stare stayed with me.” The powerful effect re-engaging with digital possessions can have on an individual has been documented before, but these experiences go towards showing that even if the memory is painful, the effect on the individual is not always negative; in Noah-52’s case, it is something that he would not want to forget.

Reflections

As with reminiscence, participants often reflected on their past relationships when telling their story. Where reminiscence is more ‘backward-looking’, as individuals remember past events, reflection is a more constructive activity, where individuals assess and process, enabling them to move on [3,30]. Wilson-22 summarized his conflicting emotions as he reflected on the nature of his relationship, leading him to bigger questions about how to act or interact with his ex-partner outside of a romantic context: *“It feels different. You know this person was meaningful to you, but you’re not sure how meaningful they are anymore, because you don’t know if you will get to be with that person anymore, or interact with them in any way. So you’re looking at the picture and you’re like... ‘That person used to go to the same places I go’.”*

Bittersweet reflections occurred for some participants (n=4), such as Emma-18, who recalled *“It was a happy relationship, so looking at the digital possessions was good and bad. It makes me sad because I do miss it, but at the same time, I know it was the right thing to do. [The digital possessions] reminded me of all the good times we have, and that’s a happy thing.”* Similarly, Noah-52, considered his decision to end his relationship while looking at his digital possessions, again experiencing this bittersweet reflection: *“I’ve made the right decision. I’m not going back. And, the images that are in there, when I’m comfortable with them again, they’re to try and reconnect, to show me that it wasn’t all counterfeit. It was flawed, it was difficult, but good things are worth working for.”* Ava-34 reflected on her break up when discussing her chat history, revealing how she reconstructed memories to make her desire to end her relationship more acceptable: *“I said that our relationship was horrible, and he said ‘No, go through your chat, it wasn’t horrible.’ When you go through my chat, you can see indeed that we had a very good relationship, until I fell in love with someone else. It was very confronting. And it was also that I wanted it to be bad, because then I had a reason to break up.”*

Managing Digital Possessions

Participants engaged in multiple forms of managing their digital possessions – deleting their possessions, abandoning them, hiding them, or simply letting them fall into disuse.

¹ Also known as a restraining order, prohibits a person from being in physical or verbal contact with another person; all communication between parties must cease.

Some even used a combination of these; Deborah-19 discussed a social media post her then-partner made to her Steam² profile. He had left a message that said “I <3 YOU!”. Deborah-19 explained that she wanted to keep a copy of the message in case her ex-partner deleted it, saying *“I screenshotted it after we broke up, because I thought that he would delete it. I wanted to have it somewhere. I screenshotted it, and then I deleted it! I just wanted to keep it in the ‘folder in the closet’, not out there in the world.”* Deborah-19 made the decision to delete this outward-facing digital possession, while retaining a copy for herself. Baozhai-21 outlined her motivations for deleting all of the chat history and text messages between her and her ex-partner, commenting *“it was too hard to see them, and it reminded [her] of how good it used to be, before he betrayed [her].”* Mia-20 found it hard to delete her chat history and text messages, but took the opportunity to make a fresh start after purchasing a new phone; *“I was doubting the decision I made, but then that’s why I needed to delete them on my new phone, because I kept doubting myself.”* Zoe-33 felt the same, stating *“I don’t have any texts, messages, or stuff like that, just because when you upgrade your phone you can kind of put all that away.”*

It was common among the participants to simply abandon digital possessions rather than deal with them through any active curation. Emily-23 stated *“I just don’t see the point in removing it. I could, but who would even know? I could literally delete them all now, but no one would even know because no one goes and looks that far. Everyone’s only looking at the last year or so.”* Wilson-22 echoed Emily-23’s sentiments, explaining that the process of deleting wouldn’t be worth the effort; *“I didn’t delete it. I couldn’t be bothered. There were not so many pictures that I would see day-to-day, so I was like, why would I even start deleting that stuff?! I didn’t think it was worth it to start throwing stuff out.”* Bella-20 also simply left many of her digital possessions where they were, citing the fact that deleting them wouldn’t change the past, and that her ex-partner still held meaning to her: *“I don’t see the point in getting rid of it all, because it happened, and it was part of my life, and he’s still really important to me.”*

Some participants (n=6) discussed how they felt about the act of curating during their interviews. Ava-34 brought up the concept of a priority list to deal with digital possessions after a break up – things like separating financial lives and dividing up physical assets. When talking about a previously shared Facetime account post-break up, Ava-34 said, *“For some reason, the digital is on, really, the lowest priority list. Even though I am abroad and the digital is a communication medium, and it’s important to me, it’s still the lowest of my priorities.”* Ethan-24 spoke of the statements an individual could make with their choices

concerning curation in the context of a relationship break up. *“The content you have on social media, on Instagram or Facebook, is always there until you choose to delete it. These things don’t just delete themselves... you can read a lot into that.”* Wilson-22 echoed Ethan-24’s thoughts, albeit in a slightly more positive way. He felt that *“if you keep pictures of someone, then that means that the person has meaning to you.”* Emma-18 viewed curation as a means by which an individual could keep a history of their past, something to be shared with a future family. *“If you delete them, they’re gone forever... in 20 years’ time, when you’re married with kids, you can look back on this...”*

Experiences of Technology

The power to delete

Technology was not always seen to be beneficial in the context of managing digital possessions after a relationship break up; in some cases, it made the process more complicated. After his relationship came to an end, Ethan-24 decided to delete all of the digital possessions relating to it from his computer. Despite adopting the role of a Deleter [33], he was unsuccessful in removing all the digital possessions due to a number of issues. Although successful in removing the digital possessions that were easily found via search methods, Ethan-24 found to his dismay that a large number of digital possessions escaped his cull: *“Not all of it, but an awkwardly high percentage is still around. Everything that is searchable by name is removed... everything like documents, leases, forms, little joint bits and bobs are all gone. But it’s the stuff that’s labelled ‘IMG_9111’, that you can’t identify without looking at it. There’s no meta-data, no field that you can... Yeah, that’s an issue.”* There were a number of participants (n=10) that talked about unmet needs and potential solutions when it came to managing their digital possessions after a relationship break up. Zoe-33 highlighted an issue in that she felt there was little support available even for selectively deleting digital possessions; beyond going through and deleting every item individually, she felt that there was no *“easy option”* to do so, and that this was not something she would have *“the time or energy to be doing”*.

Ethan-24 faced a second issue when it came to deleting all of his digital possessions. Even though he was able to delete the more obvious and easy to identify digital possessions, he was frustrated to find that his computer was trying to restore the files he thought he had successfully deleted in a misguided attempt to help him retain his digital possessions. Using Time Machine on his Mac to make deleted files easily recoverable, Ethan-24 was surprised to find that the program was keeping files that he thought he had permanently deleted, both from his hard drive and from his backup, the technology trying to forge a connection between the ex-partners: *“You scroll back chronologically, and the file is still there! So, I just don’t know what to do. It’s like it’s wanting to help you by saying ‘You might want*

² Steam is a digital distribution platform for gaming developed by Valve Corporation, and includes a social networking service.

to get this back!', but I'm like, 'I'm okay, I do not want this back! Let it go!'"

Similarly, Bella-20 had experiences of technology connecting her to her ex-partner after the relationship came to an end. Bella-20 remained close to her ex-partner after their break up, and as a result, did not remove her as a Facebook friend. This became problematic, as her Facebook feed often had updates from her ex-partner in it: *"The worst is when you find photos of them with new people... That was horrible. [It would have been useful] if Facebook didn't feel the need to tell me."* On a related note, Emily-23 thought that, practically, she could have deleted the digital possessions from her relationship, but felt that on an emotional level there was no way she could have done so. Having been the one to end the relationship, there was guilt associated with dismantling the digital possessions: *"I felt like such a shitty person that I don't think I even had the option [to delete things] – I think it would have been really hurtful because you don't know if he's going back on and looking at these pictures."* Sophia-25 was troubled by the lack of control on applications such as Google Photos; *"I wish I could go on Google Photos, and, where all your photos are laid out, I wish I could mark certain ones not to be shown in the giant list of doom. Just hide them, stash them away somewhere, in an archive or something."*

Decoupling and disconnecting

In terms of solutions to problems they faced when managing their digital possessions after a break up, Deborah-19 and Wilson-22 both wanted friendships on Facebook to more accurately reflect the state of the relationship, rather than existing as a static connection. Deborah-19 stated *"Maybe you could put a timer on a friendship on Facebook, so that right after the break up, you can only see their public profile, but you're still friends. As time goes on, if you two don't want the friendship to still exist, it will automatically remove them? Not exactly that, but... Let it fade?"* Wilson-22 echoed this, saying that he would appreciate *"something that would behave the same way that relationships do. So, when people start to go rogue on each other, it would go rogue as well!"* Sophia-25 had a simple request for a *"Netflix decoupler"*, which could be expanded to a tool that digitally disconnects two individuals, beyond just Netflix, as well as a request for a tool where individuals could *"type their name in, and it says, 'Do you know you're still sharing location services with this person?' That would have been quite good."* Ethan-24 wanted some way of limiting the lifespan of digital possessions, limiting one of the powerful benefits of the digital domain (replicability) in exchange for more clear ownership: *"If you couldn't copy the file, so it would only exist in one place. Maybe through a format of some kind... Or maybe once it's copied, there would be a parameter that says 'this is in six locations other than here'."*

Baozhai-21 and Ava-34 had opposing views on a 'one click to remove' feature; Baozhai-21 said she would like it if a

tool was available to *"use facial identity on photographs, one click to delete everything containing his face on social media. One click to remove."* Ava-34, was more keen on maintaining a connection with her ex-partner and his friends. The idea of having such an easy option to delete digital possessions or remove friends on social media did not appeal to her: *"Right now I'm holding on tight to all my friends and also my ex-partner's friends; I want to keep them all. So when you have one button... Boom! My God!"* Olivia-19 wanted the opposite to that of Baozhai-20, desiring some method of compiling all related digital possessions from her past relationship, to form a digital memory book that she could browse at a later date. *"If there could be a wee thing where you could compile everything we'd ever written, including text messages and everything... It would have been nice to have all that in one place, just to have it separate and even look back at the nice things."*

DISCUSSION

In the research reported above, we asked 13 participants to share their stories about how their romantic relationships came to an end. We investigated how those individuals used digital technologies and digital possessions after a romantic relationship came to an end. In this section, we highlight future research plans as we discuss design opportunities and potential systems that could emerged from the study.

Decoupling and Disconnecting

Separating oneself from an ex-partner in a digital context is incredibly difficult; technologies that aim to support and connect partners can be subverted to force a connection, and dealing with digital possessions that link partners together is not as simple as pressing a delete button and forgetting about them [18]. While many of the participants in this research expressed a desire for methods to decouple and disentangle from their ex-partner digitally, there is a need for a subtle strategy to do so when designing systems with this goal in mind. The concept of disentangling digital presences may seem helpful in hindsight, yet in the forming of a relationship, and certainly during one, this concept is counterproductive. If becoming entangled in a digital context is a trademark of a relationship, it then becomes important to design for that, and not to discourage partners by designing systems that obviously prepare for disentangling.

Is the best case, then, one where partners are encouraged to engage with systems that help form these digital connections, while the systems silently use the same user input to prepare for the potential end of the relationship? One example based on the interviews is that of Ethan-24's issue of trying to delete files that have no meaningful or easily identifiable name or metadata. If a system were to encourage Ethan-24 to tag his partner in any new photos at the end of each day, or to place them in a special folder dedicated to their relationship, the task would contribute to the immediate goal of strengthening the partners' entanglement. It would also result in all of their photos

being in one, easy-to-find location, which would greatly reduce the effort required to manage the digital possessions post-break up. The twofold motivation behind this, or the motivation behind any task with a similar aim, would not be revealed to the individual using the system.

Other scenarios are more complicated; for example, partners sharing one Netflix profile while in a relationship results in truly entangled shared preferences, which cannot currently be individualised after a break up. This is exemplary of the issues many partners face after ending a relationship. When systems are shared by both partners during a relationship, is the best course of action to simply delete the profile and have each individual start again after the break up? Doing so would certainly contribute to decoupling the ex-partners, and would provide an opportunity for each individual to create shared data with a new partner. However, there is no nuance in such a solution, and the loss of data for both ex-partners would be frustrating. Again, designers should focus their efforts on creating outward-facing systems that encourage partners to become digitally entangled, but have those systems also prepare to allow partners to separate easily if the relationship does come to an end. In the case of Netflix, the system could present individuals with a list of all the shows and movies they have watched since the profile was created, and request that they select the content they enjoyed and would like to see more of, in order to migrate their individual preferences to a new account.

In some cases, such as that of Noah-52, the entanglement between ex-partners extends beyond the romantic relationship to include other individuals; his and his ex-wife's children. How do individuals decouple and disentangle their digital presences when they will be linked by other digital connections that they actively try to maintain? Two participants, Wilson-22, and Deborah-19, spoke of their desire for SNS to more accurately reflect the change in their relationships that ex-partners experience when they break up; if ex-partners communicate less on the SNS over time, the SNS would reduce levels of exposure between the individuals in parallel. This could be applied to individuals in similar situations to Noah-52 and his ex-partner; SNS could reduce opportunities for the pair to interact after their break up by, for example, hiding any of the ex-partners' comments on their children's posts by default, requiring additional effort in order to see them.

Designing Around Guilt

Despite so many participants speaking of their desire to more easily decouple and disentangle from their ex-partners, the introduction of guilt to a break up was seen to influence this decision. Some participants wanted to both disconnect from their ex-partners and maintain a limited connection with them at the same time. While some participants wanted to share aspects of their 'life after the break up' on SNS, they did not want to offend their ex-partner by doing so. Previous research has highlighted the

importance of defriending an ex-partner on SNS when attempting to disconnect from them, as reducing opportunities to see their digital content is beneficial to each partners' mental wellbeing [10,21]. In order to comply with this, but still allow individuals to check up on their ex-partners, there may be an opportunity here to design around shared connections on SNS by designing around mutual friends.

A system based on revealing whether or not an ex-partner has posted anything recently, and if those posts have been positive or negative, without simply letting the individual view their ex-partner's profile, could play around this tension between an individual's desire to move on, and their need to assuage any guilt they feel over instigating the end of the relationship. One solution could be that of nominating a mutual friend to check up on the ex-partner, and relay their assessment to the individual. Although leaning on the social aspect of SNS provides a solution to the problem, it may raise its own issues; for example, the nominated mutual friend may feel like they are betraying the ex-partner by spying on them.

Promoting Reflection to Enable Curation

A large part of disentangling from an ex-partner after a break up is in the creation of a new identity as an individual. This decoupling of digital presences involves curating and managing the digital possessions that contribute to an individual's digital identity. How individuals deal with digital possessions after a relationship break up has been the subject of previous research; as was established, reminiscence by itself in the context of romantic relationship break up is emotionally taxing, and is something individuals avoid if possible [33]. When combined with reflection, however, it becomes an opportunity to learn and move on.

There are systems currently available that show individuals' digital possessions over time (such as Facebook's 'On This Day' or TimeHop), and while these systems prompt reminiscence, they do not encourage reflection. Although opportunities exist on these systems for individuals to reflect, by, for example, commenting on a digital possession presented by 'On This Day', nowhere are individuals currently actively encouraged to engage in reflective practice. Designers have explored the use of technology to promote reflection in everyday contexts [38], but not in the context of relationship break ups. There is an opportunity here to design for promoting reflection as a response to relationship break up; systems based around presenting individuals with digital possessions after a relationship ends, and employing a reflective model such as Gibb's reflective cycle. By encouraging individuals to think about what happened in the relationship and during the break up, how they feel about their experience, what went well and what went badly, and what they can take away from the experience [3], systems can reduce the emotional distress caused by coming into contact with digital

possessions from the relationship. Making it less difficult to curate and manage digital possessions could contribute to a smoother transition from a digital identity in which the individual is part of a relationship to a digital identity in which the individual is an individual.

Beyond reflecting on digital possessions, the next challenge for designers becomes designing for the curation of those possessions; previous research has shown that the established grammars of action for managing digital possessions are very limited, and call for the design of more nuanced grammars of action that more accurately reflect what individuals seek to do with their digital possessions [17]. This is the next step in this research, which will involve co-designing targeted and useful grammars of action in the context of relationship break up.

CONCLUSION

This research focused on designing systems to better enable individuals to decouple and disentangle from an ex-partner after a romantic relationship break up. Gathering insights from the stories and experiences of 13 participants between the ages of 18 and 52, we identified opportunities for design around decoupling and disconnecting, designing around guilt, and promoting reflection to enable curation. Future work will focus on the creation of more accurate grammars of action in a co-design setting to allow for disconnecting through the curation and management of digital possessions. Each relationship and subsequent break up outlined in this research was unique, and as the individuality of the participants' experiences is what makes these findings so valuable, no attempts have been made to generalize the findings.

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